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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,165	07/17/2008	Kazuhiko Terashima	04632.0067	4580

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EXAMINER	
NOLAN, PETER D	

ART UNIT	PAPER NUMBER
3661	

MAIL DATE	DELIVERY MODE
02/19/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,165	TERASHIMA ET AL.	
	Examiner	Art Unit	
	Peter D. Nolan	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _03 February 2006_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-7_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-7_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _03 February 2006_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _5/1/2006_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 5/1/2006 has been considered and placed of record in the file.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Habisohn (US 6102221).

Regarding claim 1, Habisohn teaches a method for controlling a crane drive unit so as to suppress sway of a load suspended by a rope of a crane, which sway occurs when the load has been transported from a first position to a second position (**see Habisohn column 3, lines 29-32**), the control being made by operating a controller having a filter unit by using a feed-forward control program (**see Habisohn figure 2,**

Motor Controller 26 containing Damping Filter 40 and column 3, lines 13-28), comprising: removing a component near a resonance frequency by the filter unit from a transportation command for the load (**see Habisohn column 5, line 66 thru column 6, line 5 and column 10, lines 6-27**), in which command a maximum value among at least one of a transportation speed, transportation acceleration, and transportation jerk is limited (**see Habisohn column 21, lines 39-54**), under the resonance frequency sequentially computed from a rope length that is a distance from the center of rotation of the sway of the rope to the center of gravity of the load (**see Habisohn column 7, lines 34-44; column 10, lines 6-27; column 13, lines 46-54**) and under parameters that relate to a control unit of the crane drive unit and that are previously computed so as not to exceed a performance of the crane drive unit (**see Habisohn column 5, line 66 thru column 6, line 5 and column 10, lines 6-27**); and inputting the transportation command from which the component near the resonance frequency is removed into the crane drive unit, thereby controlling the crane drive unit so that the load does not greatly sway when the load is transported from the first position to the second position (**see Habisohn column 5, lines 37-49**).

Regarding claim 2, Habisohn teaches a system for controlling a crane drive unit so as to suppress sway of a load suspended by a rope of a crane, which sway occurs when the load has been transported from a first position to a second position (**see Habisohn figure 2, motor controller 26 and column 5, lines 18-24**), the control being made by operating a controller having a filter unit by using a feed-forward control program (**see Habisohn figure 2, Motor Controller 26 containing Damping Filter 40**

and column 3, lines 13-28), comprising: a rope length detection unit for detecting a rope length that is a distance from the center of rotation of the sway of the rope to the center of gravity of the load (**see Habisohn figure 1, Rope Length Sensor 45 and column 5, lines 50-52**); a resonance frequency computing unit for computing a resonance frequency of the rope having said rope length (**see Habisohn column 5, lines 44-46; column 7, lines 34-44; column 13, lines 46-54**); a transportation command transmitting unit for transmitting a transportation command for the load given by a transportation command applicator (**see Habisohn figure 1, Motion Selector 34 and column 5, lines 33-34**); a parameter computing unit for previously computing parameters for a control unit of the crane drive unit so that the parameters do not exceed a performance of the crane drive unit (**see Habisohn column 21, lines 39-54**); a parameter storing unit for receiving and storing the parameters from the parameter computing unit (**see Habisohn column 21, lines 39-54**); a maximum value limiting unit for limiting a maximum value among at least one of a transportation speed, transportation acceleration, and transportation jerk in the transportation command for the load from the transportation command transmitting unit under the parameters from the parameter storing unit (**see Habisohn column 21, lines 39-54**); and a filter unit for receiving the resonance frequency from the resonance frequency calculating unit, the filter unit removing a component near the resonance frequency from the transportation command in which the maximum value is limited by the maximum value limiting unit (**see Habisohn column 5, lines 44-46; column 7, lines 34-44; column 13, lines 46-54**), under the parameters from the parameter storing unit, the filter unit inputting in the

crane drive unit the transportation command from which the component near the resonance frequency is removed (**see Habisohn column 5, lines 37-49**).

Regarding 3, Habisohn teaches a medium in which a feed-forward control program is stored (**see Habisohn column 5, lines 53-58**), the feed-forward control program controlling a crane drive unit by a controller having a filter unit so as to suppress sway of a load suspended by a rope of a crane, which sway occurs when the load has been transported from a first position to a second position (**see Habisohn column 3, lines 29-32. See also Habisohn figure 2, motor controller 26 containing filter unit 40 and column 5, lines 18-24**), the feed-forward control program being programmed to cause the filter unit of the controller to remove a component near a resonance frequency from a transportation command for the load (**see Habisohn column 5, lines 44-46; column 7, lines 34-44; column 13, lines 46-54**), in which command a maximum value among at least one of a transportation speed, transportation acceleration, and transportation jerk is limited (**see Habisohn column 21, lines 39-54**), under the resonance frequency sequentially computed from a rope length that is a distance from the center of rotation of the sway of the rope to the center of gravity of the load (**see Habisohn column 7, lines 34-44; column 10, lines 6-27; column 13, lines 46-54**) and under parameters for a control unit of the crane drive unit, which parameters are previously computed so as not to exceed a performance of the crane drive unit (**see Habisohn column 5, line 66 thru column 6, line 5 and column 10, lines 6-27**), the feed-forward control program being also programmed to cause the filter unit to input the transportation command from which the component near the

resonance frequency is removed in the crane drive unit **(see Habisohn column 5, lines 37-49)**.

3. Claims 4-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Robinett et al. (US 6442439 B1).

Regarding claim 4, Robinett teaches a crane having a turning motor for turning a crane boom, a turning motor control unit for controlling a speed and a direction of rotation of the turning motor, a rolling-up motor for rolling a rope of the crane up and down, and a rolling-up motor control unit for controlling a speed and a direction of rotation of the rolling-up motor **(see Robinett figures 1 and 2 and column 4, lines 15-22 and lines 57-57 where an operator of a crane controls: (1) slew velocity, (2) luff angle velocity, and (3) hoist velocity. See also column 5, lines 11-17 where the filtered operator commands are output to the respective servo controllers for slew, luff and hoist)**, further comprising: a rope length detection unit for detecting a present length of a rope of the crane **(Robinett does not explicitly disclose a rope length detection unit for detecting a present length of the rope. However, it is inherent that the system in Robinett contains a rope length detection unit because the filters for slew velocity and luff velocity are dependent upon the hoist line length (see Robinett column 6, line 66 thru column 7, line 13 and claims 6, 7))**; and a controller electrically coupled to both the turning motor control unit and the rolling-up motor control unit **(see Robinett column 7, lines 14-17)**, the controller outputting to the turning motor control unit a signal transformed from a signal of the rope length by a feedforward control so as to suppress sway of a load suspended from the

rope at a moment when the load has been transported from a first position to a second position (**see Robinett column 7, lines 14-17 and figure 2. See also Robinett column 6, line 66 thru column 7 line 13 and claims 6, 7. Although Robinett shows feedback in figure 2, it should be understood that the filter 22 in Robinett uses feedforward control and does not depend on the feedback, as shown in the above citations**).

Regarding claim 5, Robinett teaches where the crane further comprising a boom-hoisting motor for hoisting the crane boom and a boom-hoisting motor control unit for controlling a speed and a direction of rotation of the boom-hoisting motor, wherein the boom-hoisting motor control unit is electrically coupled to the controller (**see the rejection of claim 4 above regarding the control of the luff velocity**), and the controller further outputs to the boom-hoisting motor control unit the signal transformed from the signal of the rope length by the feed-forward control so as to suppress the sway of the load suspended from the rope at the moment when the load has been transported from the first position to the second position (**see the rejection of claim 4 above regarding operation of the filters in the system in Robinett, which contains a filter for luff velocity**).

Regarding claim 6, Robinett teaches where the controller is attachable to an existing crane (**see Robinett column 3, lines 13-24**).

Regarding claim 7, Robinett teaches a controller for a crane attachable to an existing crane (**see Robinett column 3, lines 13-24**) that includes a turning motor for turning a boom of the crane, a boom-hoisting motor for hoisting the boom, a turning

motor control unit for controlling a speed and a direction of rotation of the turning motor, and a boom-hoisting motor control unit for controlling a speed and a direction of rotation of the boom-hoisting motor (**see Robinett figures 1 and 2 and column 4, lines 15-22 and lines 57-57 where an operator of a crane controls: (1) slew velocity, (2) luff angle velocity, and (3) hoist velocity. See also column 5, lines 11-17 where the filtered operator commands are output to the respective servo controllers for slew, luff and hoist**), wherein only a signal of a rope length of the crane is inputable to the controller , and wherein the controller outputs a signal transformed from the signal of the rope length by a feed-forward control so as to suppress sway of a load suspended from a rope of the crane at a moment when the load has been transported from a first position to a second position under a condition that there is no disturbance (**see Robinett column 7, lines 14-17 and figure 2. See also Robinett column 6, line 66 thru column 7 line 13 and claims 6, 7 where the filtering is dependent on the rope length L3. Although Robinett shows feedback in figure 2, it should be understood that the <u>filtering</u> in Robinett uses feedforward control and does not depend on the feedback, as shown in the above citations**).

Conclusion

Any inquiry concerning this or any earlier communication from the examiner should be directed to Examiner Peter Nolan, whose telephone number is 571-270-7016. The examiner can normally be reached Monday-Friday from 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black, can be reached at 571-272-6956. The fax number for the organization to which this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Peter D Nolan/

Examiner, Art Unit 3661

2/4/2009

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661